

Montana 2007 Antimicrobial Susceptibility Testing Survey

Executive Summary

In April 2007, the Montana Department of Public Health and Human Services, Public Health Laboratory administered an antimicrobial susceptibility testing (AST) survey. This survey requested AST data and assessed AST practices from 2006 as part of a regional project involving Montana, North Dakota, South Dakota, and Wyoming. This regional project is a component of the National Laboratory System (NLS) Initiative to Integrate Clinical Laboratories into Public Health Testing. By assessing the status of AST practices and determining susceptibility trends across Montana and the Northern Plains region, we are able to identify areas of concern regarding AST, and provide educational opportunities to address these concerns. In Montana, those laboratories that were known to provide AST were solicited, and 38 (63%) of these 60 clinical laboratories completed the survey. In addition, 25 (66%) of the 38 laboratories provided antibiogram data.

- **Demographics**

The majority of responding laboratories were in critical access hospitals that had fewer than 200 beds, primarily served a small city plus rural population, and were certified as CLIA Certificate of Compliance Laboratories by the Centers for Medicare and Medicaid Services (CMS). These laboratories had at least one full-time equivalent (FTE) trained to perform microbiology, although this staff was often not dedicated microbiology staff, as these FTEs were also cross-trained in other areas of the laboratory.

- **Practices**

Most responding laboratories followed the most current Clinical and Laboratory Standards Institute (CLSI) M100 standards, had their CLSI guidelines purchased by their institution, and had a designated person to integrate CLSI guideline changes. Although less than half of the laboratories received CLSI guidelines yearly, most responded that the CLSI guidelines were the most influential in the decision to implement changes in AST practices.

- **Antibiograms**

Slightly more than half of the responding laboratories created antibiograms, and compiled cumulative antibiograms yearly. The majority of responding laboratories relied on automated instrument printouts as a resource for generating their cumulative antibiogram, and per recommended practice, removed surveillance isolates and multiple patient isolates from the same patient episode from their cumulative antibiogram.

- **Training**

The majority of responding laboratories do not have someone on staff dedicated to providing AST training, and do not provide annual AST training.

- **Methods**

Most responding laboratories performed AST using Minimum Inhibitory Concentration (MIC) methodology, either manual or automated, and reported results based on MICs and CLSI interpretation (S, sensitive; I, intermediate; R, resistant). Slightly more than half of these laboratories always include a purity plate for MIC. For those laboratories performing

disk diffusion, slightly more than half reported results based on the diameter of the zone of inhibition and CLSI interpretation (S, I, R).

- **Knowledge**

Knowledge-based scenario questions were asked to assess the practices of the responding laboratories and the current knowledge of the respondent. Questions involved the reporting of appropriate antimicrobials, the recommended methods for confirming certain AST patterns, such as for vancomycin resistant enterococci (VRE), vancomycin intermediate or resistant *Staphylococcus aureus* (VISA/VRSA) or extended spectrum beta-lactamase (ESBL) producing organisms, and referral patterns. Less than half of the laboratories responded correctly to the knowledge-based questions.

Conclusions

Rural states, such as Montana, are challenged in providing high quality laboratory services, in part due to population base and geographic distances. The concerns highlighted by this AST assessment are found not just in Montana, but in the other states in the assessment as well (North Dakota, South Dakota, and Wyoming). Many laboratories are staffed with clinical laboratory professionals who are expected to be proficient in all laboratory disciplines, and cannot specialize in certain disciplines such as microbiology and antimicrobial resistance testing. It is difficult for these professionals to find the time and resources to attend training or to implement new methodologies. This AST assessment identified the primary area of concern to be AST training, including how to use and apply CLSI guidelines, how to select appropriate antibiotics for testing, and how to create an antibiogram. In addition, the frequency of training opportunities and the best delivery method for AST training were addressed.

As a result of this assessment, the Montana Public Health Laboratory addressed these training concerns by providing AST trainings using various delivery methods: on-site trainings in 2 rural towns, a lecture format at a state clinical laboratory science meeting, and through distance learning offerings. As part of this training, laboratory professionals were reminded of the importance of reporting and submitting isolates of AST significance to the Montana Public Health Laboratory (MTPHL), to aid in public health surveillance of antimicrobial resistance patterns.

In addition to training, appropriate CLSI guidelines were purchased by MTPHL and provided to all of the clinical laboratories performing antimicrobial testing, and trainings reinforced and encouraged the use of CLSI guidelines and the sharing of antibiogram data. Also, for those laboratories that manually collect their AST data, an antibiogram tool was developed to streamline this data collection process.

Based on responses from the participating clinical laboratories, the Montana Public Health Laboratory needs to take a more active role in providing AST training and consultative services to our clinical laboratory partners. Performing high quality diagnostic testing, providing advice regarding treatment of infected patients, and informing Infection Control practitioners when new or persisting problem pathogens have been identified are all vital responsibilities in the effort to prevent and control AMR. Appropriate testing practices for AST, and the standardization of these practices, are crucial to recognizing and controlling antimicrobial resistance.